

**Report to the
Virginia Department of Agriculture and Consumer Services—2006**

**Evaluation of peanut cultivars in an organic peanut
production system in Virginia**



D. Ames Herbert, Jr. & Dennis L. Coker
Virginia Tech Tidewater AREC
Suffolk, VA 23437

Cooperator:
Bill Jardine, Quail Cove Farms, Northampton County, VA

PROJECT SUMMARY:

A field trial was established on Eastern Shore, Virginia at Quail Cove Farms in Northampton County to evaluate the performance of peanuts in an organic farming system. Seven peanuts varieties or lines were planted on May 31, 2006 in randomized strips (four rows by 110 ft) replicated five times. On July 28, Entrust[®] Naturalyte Insect Control (spinosad) was applied for potato leafhopper on two of the four rows of each plot at 3 oz per acre. Data collected included leafhopper sweep net counts and injury ratings, disease ratings, pod damage by soil insects, and pod yield and quality.

Combined across peanut varieties, Entrust[®] provided no significant difference in leafhopper numbers (the mean number in the treated plots was 33 leafhoppers per 25 sweeps, while the untreated plots had 34 leafhoppers). However, there were differences in the number of leafhoppers between varieties with Georgia Red, C11-2-39 and GPNC 343 having the fewest. There was no interaction between variety and number of leafhoppers. Disease ratings indicated very little tomato spotted wilt virus (only 3 hits in the entire test) and no cylindrocladium black rot. There was a significant difference in pod damage by soil insects, with Wilson and C11-2-39 varieties having less scarified pods compared with all other varieties except VA 98R. Combined across Entrust[®]-treated and untreated plots, the virginia-type peanut varieties VA 98R (2803 lb/acre), Wilson (2801 lb/acre), NC-V 11 (2682 lb/acre) and Champs (2541 lb/acre) had significantly higher yields than the virginia-type GPNC 343 (2123 lb/acre) and the runner-types Georgia Red (1933 lb/acre) and C11-2-39 (1151 lb/acre).

These yields are considered good given three uncontrollable disadvantages that occurred during the trial which reduced yield potential. First, the late planting date of the trial prevented many pods from reaching maturity. The trial was not planted until May 31 and the optimum planting window for peanuts in Virginia is from the end of April through mid May. Second, moisture was below normal for much of the summer (weather data are available on request) which further delayed the development of plants, flowering and pegging. Lastly, wet weather set in after peanuts were dug on October 27 so they could not be harvested until 24 days later on November 20. The normal interval between digging and harvesting is about 5 to 7 days. Having peanuts exposed to the weather for over three weeks caused a weakening of vines, shedding of some pods, and losses to foraging birds and deer. Weeds were also a challenge. Although the two hand-cultivations reduced weed populations, many large weeds (i.e., pigweeds, lambsquarters, jimsonweed, and various grasses) became established. Even with these disadvantages, the 2800 lb/acre pod yields of VA 98R and Wilson were quite competitive with statewide averages. According to the Virginia Agricultural Statistics Bulletin (Nos. 80 and 81), average yields for the conventionally grown peanut crop for 2004 and 2005 were 3,250 and 3,000 lb/acre, respectively. The yields achieved in this first organic peanut variety trial suggest the system has good potential for profitability, especially given the low input costs compared with non-organic systems. But, it is also important to note that this trial was placed in a field with no prior history of peanut production and so lacked the accumulated disease inocula in the soil that is a limiting factor in the traditional peanut production area. This lack of disease can only be maintained if long-term rotation systems with non-legumes can be established. It is also recommend that irrigation be considered in any long-term planning. In dry years, irrigation can increase peanut yields by as much as 1000 lb/acre and increase kernel quality. Kernel quality data based on standard peanut grading procedures are forthcoming.

TEST: Evaluation of peanut cultivars in an organic peanut production system in Virginia

LOCATION: Quail Cove Farms, Northampton County, VA

VARIETIES TESTED:

- | | |
|------------|----------------|
| 1. CHAMPS | 5. Georgia Red |
| 2. Wilson | 6. GPNC 343 |
| 3. NC-V 11 | 7. C11-2-39 |
| 4. VA 98R | |

EXPERIMENT PLAN: Rows 1 and 2 were treated with Entrust[®] Naturalyte Insect Control (spinosad) at 3 oz per acre on July 28, 2006 for potato leafhopper. Leafhopper sweep net counts were taken on July 28 and August 3 and were based on the number captured per 25 sweeps with a 15-in diameter sweep net per plot. Leafhopper injury ratings taken on July 28 represent a visual per plot estimate of percent injury to plants by leafhopper and disease ratings represent a per plot visual estimate of injury by diseases including tomato spotted wilt virus and cylindrocladium black rot. Pod damage by soil insects is based on the number of scarified pod walls and penetrated pods from a pre-harvest sample of 25 full-sized pods randomly selected per plot after digging. Yields are based on harvesting 220 row ft per plot by combine and adjusting moisture content to 7%.

TEST DESCRIPTION: Off-station organic peanut performance trial

EXPERIMENTAL DESIGN: Randomized strips (5 replicates)

PLANTING DATE: May 31

PLOT SIZE: 4 rows x 110'

ROW SPACING: 36"

DIG DATE: October 27

HARVEST DATE: November 20

ROW FEET HARVESTED: 220 per plot

HARVEST TECHNIQUE: Two-row peanut combine

COMMENTS:

- The pre-treatment number of leafhopper adults and nymphs was 10.5 and 1.2, respectively (based on ten 15-sweep net samples on July 24).
- Peanuts were hand-weeded two times.
- Disease ratings on August 25 indicated very little tomato spotted wilt virus (3 hits in entire test) and no cylindrocladium black rot; therefore, disease data was not included in analyses.

Table 1. Leafhopper counts and visual injury ratings, Quail Cove Farms (Bill Jardine), Northampton Co., VA. Treated plots received Entrust @ 3 oz/acre on July 28. Tidewater AREC, Suffolk, Virginia, 2006.

#	Variety	Mean no. leafhoppers/25 sweeps			Visual injury rating ¹
		Jul 28	Aug 3		Jul 28
		Untreated	Treated	Untreated	Untreated
1	CHAMPS	35.3 ab ²	43.3 a	50.0 a	37.0 a
2	Wilson	46.7 a	34.3 ab	34.3 bc	35.3 ab
3	NC-V 11	48.0 a	32.3 ab	40.3 ab	36.3 a
4	VA 98R	37.7 ab	47.7 a	45.3 a	36.3 a
5	Georgia Red	22.0 bc	20.0 b	20.7 d	30.3 c
6	GPNC 343	24.3 bc	31.3 ab	24.0 cd	31.7 c
7	C11-2-39	12.3 c	21.0 b	23.3 d	32.7 bc
	LSD	21.9 P=0.03	16.8 P=0.03	10.9 P<0.01	3.5 P<0.01

¹ Ratings are an estimate of percent injury to plants by leafhopper.

² Means within a column followed by the same letter(s) are not significantly different.

Treatment mean (for mean no. leafhoppers/25 sweeps on Aug 3)

1. With insecticide	32.86 a
2. Without insecticide	34.00 a
LSD (P=0.5286)	6.51

Variety mean (for mean no. leafhoppers/25 sweeps on Aug 3)

1. CHAMPS	46.67 a
2. Wilson	34.33 b-d
3. NC-V 11	36.33 a-c
4. VA 98R	46.50 ab
5. Georgia Red	20.33 e
6. GPNC 343	27.67 c-e
7. C11-2-39	22.17 de
LSD (P<0.0001)	12.17

Split plot analysis (for mean no. leafhoppers/25 sweeps on Aug 3)

Treatment	0.5286
Variety	<0.0001
Treatment x variety	0.6888

Table 2. Mean percent pod injury and yield results, Quail Cove Farms (Bill Jardine), Northampton Co., VA. Treated plots received Entrust @ 3 oz/acre on July 28. Tidewater AREC, Suffolk, Virginia, 2006.

#	Variety	Mean percent pod injury ¹		Yield lb/acre ²	
		Scarified	Penetrated	Treated	Untreated
1	CHAMPS	36.0 a ³	0.0 a	2489 bc	2593 a
2	Wilson	14.4 b	0.0 a	2850 a	2751 a
3	NC-V 11	39.2 a	0.0 a	2682 ab	2682 a
4	VA 98R	26.4 ab	0.0 a	2848 a	2758 a
5	Georgia Red	40.0 a	0.0 a	1936 d	1931 b
6	GPNC 343	31.2 a	0.0 a	2231 c	2014 b
7	C11-2-39	12.0 b	0.0 a	1163 e	1141 c
	LSD	16.8 P=0.01	0.00 P=1.00	264.6 P<0.01	253.5 P<0.01

¹ A pre-harvest sample of 25 full-sized pods were randomly selected per plot after digging. Samples were taken on October 27.

² Yield based on weight of peanut with moisture content of 7%. Dig date = October 27 and harvest date = November 20.

³ Means within a column followed by the same letter(s) are not significantly different.

Treatment mean (for yield)

1. With insecticide	2314.1 a
2. Without insecticide	2267.1 a
LSD (P=0.4644)	161.4

Variety mean (for yield)

1. CHAMPS	2541.4 a
2. Wilson	2800.8 a
3. NC-V 11	2682.0 a
4. VA 98R	2802.8 a
5. Georgia Red	1933.2 b
6. GPNC 343	2122.6 b
7. C11-2-39	1151.5 c
LSD (P<0.0001)	302.0

Split plot analysis (for yield)

Treatment	0.4644
Variety	<0.0001
Treatment x variety	0.6947